

25190

S/056/61/040/006/011/031

B111/B201

Interaction of conduction electrons ...

in the form

где where

$$H = U_1 + H_0 + H_1 + H_2 + H_3,$$

$$U_1 = U_0 + \sum_{\mathbf{k}} (e_{\mathbf{k}1} + e_{\mathbf{k}+\mathbf{x},1}) u_{\mathbf{k}}^2,$$

$$H_0 = \sum_{\mathbf{k}} [(e_{\mathbf{k}} u_{\mathbf{k}}^2 - e_{\mathbf{k}+\mathbf{x},1} u_{\mathbf{k}}^2) \alpha_{\mathbf{k}0}^* \alpha_{\mathbf{k}0} + (e_{\mathbf{k}+\mathbf{x},1} u_{\mathbf{k}}^2 - e_{\mathbf{k}} u_{\mathbf{k}}^2) \alpha_{\mathbf{k}1}^* \alpha_{\mathbf{k}1}] + \sum_{\mathbf{k}} \omega_{\mathbf{k}} b_{\mathbf{k}}^* b_{\mathbf{k}}. \quad (8-13)$$

$$H_1 = -\frac{1}{\sqrt{N}} \sum_{\mathbf{k}, \mathbf{k}'} J(u_{\mathbf{k}} u_{\mathbf{k}'} \alpha_{\mathbf{k}1}^* \alpha_{\mathbf{k}'1} - u_{\mathbf{k}} u_{\mathbf{k}'} \alpha_{\mathbf{k}0}^* \alpha_{\mathbf{k}'0}) b_{\mathbf{k}'+\mathbf{k}+\mathbf{x}}^* + \text{K. c.},$$

$$H_2 = -\frac{1}{\sqrt{N}} \sum_{\mathbf{k}, \mathbf{k}'} J(u_{\mathbf{k}} u_{\mathbf{k}'} \alpha_{\mathbf{k}1}^* \alpha_{\mathbf{k}'0} - u_{\mathbf{k}} u_{\mathbf{k}'} \alpha_{\mathbf{k}0}^* \alpha_{\mathbf{k}'1}) b_{\mathbf{k}'+\mathbf{k}+\mathbf{x}}^* + \text{K. c.},$$

$$H_3 = \sum_{\mathbf{k}} (e_{\mathbf{k}1} + e_{\mathbf{k}+\mathbf{x},1}) u_{\mathbf{k}} u_{\mathbf{k}} (\alpha_{\mathbf{k}0}^* \alpha_{\mathbf{k}1} + \alpha_{\mathbf{k}1}^* \alpha_{\mathbf{k}0}).$$

If the terms with $\alpha_{\mathbf{k}0}^* \alpha_{\mathbf{k}1}$ and $\alpha_{\mathbf{k}1}^* \alpha_{\mathbf{k}0}$ are put equal to zero, in second approximation an equation can be obtained for compensation:

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$$\tilde{\epsilon}_A u_A v_A = -\frac{1}{2N} (u_A^2 - v_A^2) \sum_{A'} J^2 u_{A'} v_{A'} \times$$

$$\times [\omega_{g-A'+A+X} + e_{A+X} (u_A^2 - e_{A'} v_A^2 + e_{A'+X} (u_{A'}^2 - e_{A'+X} v_{A'}^2))^{-1},$$

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$$2\tilde{\epsilon}_A = e_{A'} + e_{A+X} - \frac{1}{N} \sum_{A'} J^2 (u_{A'}^2 - v_{A'}^2) \times$$

(14-15)

$$\times [\omega_{g-A'+A+X} + e_{A+X} (u_A^2 - e_{A'} v_A^2 + e_{A'+X} (u_{A'}^2 - e_{A'+X} v_{A'}^2))^{-1}.$$

After some transformations,

$$\tilde{\epsilon}_A u_A v_A = -\frac{1}{2} (u_A^2 - v_A^2) c_A. \quad (17)$$

with

$$c_A = \frac{1}{N} \sum_{A'} J^2 u_{A'} v_{A'} [\omega_{g-A'+A+X} + \tilde{\epsilon}_A + \tilde{\epsilon}_{A'}]^{-1}. \quad (18)$$

results. Proof is given that (18) has only the trivial solution $c_k=0$

which is obtained in the normal state. It is thus shown that the interaction of conduction electrons with spin waves in a ferromagnetic material has a repulsive character and cannot give rise to a superconductive state. This result is, in addition, derived from the equality of expressions for the exchange interaction with (a) longitudinal phonons and (b) spin waves.

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Interaction of conduction electrons

It is finally pointed out that a superconductive state occurs neither on interactions with spin waves, but generally if quasiparticles with integer spin are exchanged. A. I. Akhiezer and I. Ya. Pomeranchuk are mentioned. There are 1 figure and 10 references: 7 Soviet-bloc and 3 non-Soviet-bloc.

ASSOCIATION: Institut fiziki metallov Akademii nauk SSSR, Chelyabinskiy gosudarstvennyy pedagogicheskiy institut (Institute of Physics of Metals AS USSR, Chelyabinsk State Pedagogical Institute)

SUBMITTED: September 20, 1960

X

Card 5/5

VONSOVSKIY, S.V.

Objectives of physical metallurgy in the building of a material
and technical base of communism. Fiz. met. i metalloved. 14
no.3:321-326 S '62. (MIRA 15:9)

(Physical metallurgy)

S/053/62/076/003/002/005
B125/B102

AUTHOR: Vonsovskiĭ, S. V.

TITLE: Magnetism and electrical conductivity of metals

PERIODICAL: Uspekhi fizicheskikh nauk, v. 76, no. 3, 1962, 467-497

TEXT: On the basis of papers published from 1924 to 1961 a review article is presented on the present stage of the theory of magnetic and electrical properties of metals. There are 6 figures, 2 tables, and 104 references: 48 Soviet and 56 non-Soviet.

Card 1/1

S/053/62/077/003/001/002
B101/B144

AUTHORS: Vonsovskiy, S. V., Izyumov, Yu. A.

TITLE: Electron theory of transition metals. I

PERIODICAL: Uspekhi fizicheskikh nauk, v. 77, no. 3, 1962, 377-448

TEXT: A report based upon Western and Soviet publications is given on the present knowledge concerning the electron structure of the atoms of transition metals, on the electron properties of transition metals, the general conceptions of the electron structure of crystals containing atoms of transition metals, and on the band model and s-d(f) exchange model of the crystals of transition metals. Mutual approach of conceptions of the band and s-d models is said to be the next task of further theoretical development. There are 7 figures, 10 tables, and 189 references.

Card 1/1

S/053/62/078/001/001/001
B102/B104

AUTHORS: Vonsovskiy, S. V., Izyumov, Yu. A.

TITLE: Electron theory of the transition metals. II

PERIODICAL: Uspekhi fizicheskikh nauk, v. 78, no. 1, 1962, 3 - 52

TEXT: This is the second part of a review article, containing chapters III and IV (the first part appeared in UFN, 77(3), 377, 1962). III. Properties of the spin system of a transition metal. (The Hamiltonian of the electron system; spin polarization of the conduction electrons; indirect exchange interaction by electrons of spin-unsaturated layers by conduction electrons; spin wave theory of a ferromagnetic metal; magnetic relaxation and resonance in ferro- and antiferromagnetic metals; slow neutron magnetic scattering in a ferromagnetic metal). IV. The system of conduction electrons in a transition metal. (Conduction electron energy in a ferromagnetic transition metal; effective conduction electron interaction by means of spin waves and its influence on the superconducting state; conditions for the existence of a superconducting state in a ferromagnetic metal; the anomalous electric resistance of a ferromagnetic metal). Finally: the

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Electron theory of the transition ...

S/053/62/078/001/001/001
B102/B104

advantages and disadvantages of the s-d(f) exchange interaction model (Vonsovskiy, ZhETF 16, 981, 1946) are discussed and unsolved problems in transition metal physics are examined. There are 1 figure and 87 references. ✓

Card 2/2

VONSOVSKIY, S. V.

"Magnetism of the Rare-Earth Metals."

report submitted for the Conference on Solid State Theory, held in Moscow,
December 2-12, 1963, sponsored by the Soviet Academy of Sciences

TUROV, Yevgeniy Akimovich; VONSOVSKIY, S.V., otv. red.; MEDER, V.M.,
red.izd-va; SIMKINA, G.S., tekhn. red.

[Physical properties of magnetically ordered crystals;
phenomenological theory of spin waves in ferromagnetics,
antiferromagnetics, and weak ferromagnetics]. Fizicheskie
svoystva magnitoporiadochennykh kristallov; fenomenolo-
gicheskaya teoriya spinovykh voln v ferromagnetikakh, anti-
ferromagnetikakh i slabykh ferromagnetikakh. Moskva, Izd-
vo AN SSSR, 1963. 223 p. (MIRA 16:10)

1. Chlen-korrespondent AN SSSR, Otdel teoreticheskoy fiziki
Instituta fiziki metallov AN SSSR (for Vonsovskiy).
(Ferromagnetism) (Electromagnetic waves)
(Crystallography)

VONSOVSKIY, S.V., red.; SAMSONOVA, V.I., red.; KHOMYAKOV, A.D.,
tekhn. red.

[Theory of the ferromagnetism of metals and alloys]
Teoriia ferromagnetizma metallov i splavov; sbornik
statei. Moskva, Izd-vo inostr. lit-ry, 1963. 536 p.
Translated from the English. (MIRA 17:3)

1. Chlen-korrespondent AN SSSR (for Vonsovskiy).

9/026/63/000/002/002/007
A004/A126

AUTHOR: Vonsovskiy, S. V., Corresponding Member of the Academy of Sciences
USSR

TITLE: Modern concepts of magnetism

PERIODICAL: Priroda, no. 2, 1963, 33 - 47

TEXT: After some general remarks and a historical survey on the definition of magnetism and the magnetic properties of microparticles, the author presents a classification of elementary magnets, elucidates the concepts of diamagnetism and paramagnetism, distinguishes between electron and nuclear magnetism, and defines orbital and spin magnetism. He analyzes the effect of the interaction of the atomic carriers of magnetism on magnetic properties and defines ferromagnetism and antiferromagnetism. Concluding, he enumerates the various applications of magnetism in science and technology. There are 20 figures and 2 tables. ✓

ASSOCIATION: Institut fiziki metallov AN SSSR (Institute of Metal Physics of the Academy of Sciences USSR), Sverdlovsk

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S/126/63/015/002/032/033
E039/E435

AUTHORS: Vonsovskiy, S.V., Svirskiy, M.S.

TITLE: On superconductivity in non-uniform ferromagnetics

PERIODICAL: Fizika metallov i metallovedeniye, v.15, no.2, 1965,
3.6-318

TEXT: The theory on the existence of superconductivity in ferromagnetic is discussed together with some related questions. A fully penetrated field is not specially stipulated and other assumptions remain as in Ref.1 (L.N.Cooper, Phys.Rev., etc., v.7, 1962, 367). It is shown that superconductivity can only occur in ferromagnetics when

$$p < \epsilon_{0,bcs} \sqrt{\frac{1}{2} + \frac{3NeF}{2a(p)}} \quad (8)$$

where $p = \frac{1}{2} \mu I$, I - energy parameter for s - d or s - f exchange,

$\mu = \frac{1}{N_1} \sum s_1^2$, $\epsilon_{0,bcs}$ - the gap in the energy spectrum of a super-

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On superconductivity ...

S/126/63/015/002/032/033
E039/E435

conductor, ϵ_F - the Fermi sphere parameter. From Eq.(8) it is evident that the superconducting condition in ferromagnetics is possible only for sufficiently weak s-d or s-f exchanges. It is concluded that the proposals in Ref.(1) on the type of electron pairing lead not only to an explanation of the "Knight" displacement but also to a positive solution of the question of the existence of superconductivity in ferromagnetics and to the possibility of the existence of superconductivity in materials with sufficiently weak s-d or s-f exchanges.

ASSOCIATIONS: Institut fiziki metallov AN SSSR (Institute of Physics of Metals AS USSR)
Leningradskiy gosudarstvennyy pedagogicheskiy universitet (Leningrad State Pedagogic Institute)

SUBMITTED: November 17, 1962

Card 2/2

S/126/63/015/002/033/033
 2037/2435

AUTHORS: Vonnikovskiy, S.V., Svirskiy, M.S.
 TITLE: Superconductivity in nonuniform paramagnetics and
 high critical field alloys
 PERIODICAL: Fizika metallov i metallovedeniye, v.15, no.2, 1967,
 318-320

TEXT: Recent attempts to develop a phenomenological explanation
 of the high value of the critical magnetic fields for certain
 alloys are discussed. The work of L.N.Cooper (Phys.Rev.Lett.,
 v.8, 1962, 367), is considered in particular. Cooper does not
 show that the energy of superconducting paramagnetics is lower
 than the energy of normal paramagnetics. It is evident that only
 in this case is it possible to realize a superconducting para-
 magnetic and hence it is necessary to examine the conditions under
 which its energy is lower than for both the energy of the non-
 paramagnetic superconductor and the energy of the normal para-
 magnetic. Expressions for these conditions are derived and it
 is shown that

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$$H < \frac{\epsilon_0, bcs}{\mu} \sqrt{\frac{1}{2} + \frac{3}{2} \frac{N\epsilon_F}{a(H)}} \quad (5)$$

On superconductivity ...

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E039/E435

(symbols as given in previous abstract). This inequality (5) shows that when $H \rightarrow 0$ the condition for a superconducting paramagnetic is possible only for sufficiently small values of H . Larger values of H destroy the superconducting condition. For values of $\epsilon_0 \text{ bcs} \sim 10^{-16} \text{ Oe}$ and $\mu \sim 10^{-20}$ a value for the critical field H_K of not less than 10^4 gauss is obtained. The high values of H found in some alloys is explained on the basis

ASSOCIATION: Institut fiziki metallov, Chelyabinskiy gosudarstvennyy pedagogicheskiy institut (Institute of physics of metals, Chelyabinsk State Pedagogic Institute)

Submitted: November 17, 1961

Card 2/2

VONSOVSKIY, S.V. (Sverdlovsk)

Encyclopedia of modern physics; 45th anniversary of the periodical
"Uspekhi fizicheskikh nauk". Priroda 52 no.4:122-123 '63.
(MIRA 16:4)

1. Chlen-korrespondent AN SSSR.
(Physics--Periodicals)

VONSOVSKIY, S.V.

Magnetism; modern concepts. Priroda 52 no.2:33-47 '63. (MRA 16:2)

1. Institut fiziki metallov AN SSSR, Sverdlovsk; ohlen-korrespondent AN SSSR.

(Magnetism)

VONSOVSKIY, S.V.

Nuclear methods of investigation in the physics of solid bodies.
Vest. AN SSSR 33 no.8:55-61 Ag '63. (MIRA 16:8)

1. Chlen-korrespondent AN SSSR.
(Solids) (Nuclear physics)

L 5337-66 EWT(1) IJP(c) GG

ACCESSION NR: A 5021134

UR/0056/65/049/002/0682/0690

AUTHOR: Yonsovskiy, S. V.; Svirskiy, M. S.

TITLE: Theory of s-f exchange for nonvanishing orbital angular momentum

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 49, no. 2, 1965, 682-690

TOPIC TAGS: exchange reaction, rare earth element, nuclear shell model, quantum number, superconductivity

ABSTRACT: The authors analyze s-f exchange interaction in the case when the total angular momentum J of the f-shell is a good quantum number. The approach used differs from that employed in an earlier paper (ZhETF v. 37, 1354, 1964), where the quantum number J was assumed conserved. The Hamiltonian for s-f exchange connected with changes in J is established and its effects on indirect exchange interaction and on superconductivity are assessed. This Hamiltonian, together with the indirect-exchange Hamiltonian and the conduction-electron interaction Hamiltonian, which are derived on its basis, makes it possible to investigate the distinguishing features of processes accompanied by excitation of the total angular momentum of rare-earth ions. It is shown that excitations of J cannot lead to ferromagnetic ordering of different rare-earth ions, but can influence the occurrence of

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ACCESSION NR: AP5021134

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ordered states other than ferromagnetic, characterized by superpositions of states with different J. In addition, these excitations of J can contribute to the proper energy of the rare-earth ions. The special behavior effect of Eu impurities on the lowering of the critical superconductivity temperature is explained. The results obtained by R. Brout and H. Suhl (Phys. Rev. Lett. v. 2, 387, 1959) and by C. Herring (Physica v. 24, 3184, 1958) are reviewed critically. Orig. art. has: 23 formulas and 1 table.

ASSOCIATION: Institut fiziki metallov Akademii nauk SSSR (Institute of Metal Physics, Academy of Sciences, SSSR); Chelyabinskiy gosudarstvennyy pedagogicheskiy institut (Chelyabinsk State Pedagogical Institute) 44.55

SUBMITTED: 13Ma:65

ENCL: 00

SUB CODE: GP, SS

NR REF SOV: 003

OTHER: 017

Card 2/2 *hld*

ACCESSION NR: AP4023383

8/0048/64/028/003/0423/0429

AUTHOR: Vlasov, K.B.; Volkenshteyn, N.V.; Vonsovskiy, S.V.; Mitsek, A.I.; Turchinskaya, M.I.

TITLE: Unidirectional anisotropy [Report, Symposium on Ferromagnetism and Ferroelectricity held in Leningrad 30 May to 5 June 1962]

SOURCE: AN SSSR. Izvestiya fizicheskaya, v.28, no.3, 1964, 423-429

TOPIC TAGS: ferromagnetism, antiferromagnetism, cubic lattice ferromagnets, unidirectional anisotropy, nickel manganese alloy

ABSTRACT: A substance is said to possess unidirectional anisotropy (UA) when its magnetic properties differ in the two directions of the same crystallographic axis. This phenomenon was first observed by W.H.Meiklejohn and C.P.Bean (Phys.Rev.,105, 904,1956), who ascribed its appearance in their material to an exchange interaction across the boundaries between ferromagnetic and antiferromagnetic phases. Two of the present authors have suggested that UA could appear in a single ferromagnetic substance provided a weakly interacting sub-lattice constituting an antiferromagnetic subsystem were present, and they have given a thermodynamic discussion of a uni-

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ACCESSION NR: AP4023383

axial system of this sort (K.B.Vlasov and A.I.Mitsek, Fizika metallov i metallove-
deniye, 14, 487, 498, 1962). In the present paper the theoretical treatment is extended
to systems with cubic symmetry. UA is possible when the coupling between the anti-
ferromagnetic vector and the crystal lattice is stronger than the coupling between
the ferromagnetic and antiferromagnetic subsystems. The states with UA are meta-
stable and can be altered by application of a magnetic field exceeding the thresh-
old field of the antiferromagnetic subsystem. UA was observed in disordered Ni-Mn
alloys (28.1 atomic percent Mn) at temperatures below 20.4°K. The magnetization was
investigated in the [111] direction, and the UA was evinced by a characteristic bend
in the magnetization curve or by a horizontal shift of the hysteresis loop. Samples
that were cooled in the presence of a magnetic field showed UA; those that were
cooled in the zero field did not. The samples were subjected to an intense pulsed
magnetic field (up to 170 kOe) in an effort to alter their UA. At 4.2°K a field of
10 kOe appreciably altered the UA of a sample that had been cooled in a field of
1300 Oe, and a field of 130 kOe changed its sign. A sample that was cooled in the
absence of a magnetic field and initially showed no UA, acquired UA when subjected
to magnetic fields greater than 60 kOe. The degree of UA (as measured by the shift
of the hysteresis loop) was a linear function of the field for inducing fields
greater than 60 kOe. These fields are of the order of the threshold fields for typi-

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ACCESSION NR: APL023383

cal cubic antiferromagnetics. The experimental results thus support the hypothesis that the investigated alloys possess both ferromagnetic and anti-ferromagnetic states. Orig. art. has: 14 formulas and 3 figures.

ASSOCIATION: Institut fiziki metallov Akademii nauk SSSR (Institute of Physics of Metals, Academy of Sciences, SSSR): Ural'skiy gosudarstvennyy universitet (Ural State University)

SUBMITTED: OO

DATE ACQ: 10Apr64

ENCL: OO

SUB CODE: PH

NO REF SOV: 005

OTHER: 003

Card 3/3

ACCESSION NR: AP4037574

S/0056/64/046/005/1619/1631

AUTHORS: Vonsovskiy, S. V.; Svirskiy, M. S.

TITLE: Superconductivity of an electron system with singlet or triplet pairs

SOURCE: Zh. eksper. i teor. fiz., v. 46, no. 5, 1964, 1619-1631

TOPIC TAGS: superconductivity, conduction electron, phonon, Coulomb field, ferromagnetism, antiferromagnetism, paramagnetism, exchange force

ABSTRACT: The influence of the type of symmetry of the coordinate part of the wave function of the electron (cooper) pair on the establishment of the superconducting state was investigated in view of the importance of the question of the realization of the superconducting state with singlet or triplet (Cooper) pairs of conduction electrons to problems involving the coexistence of superconductivity

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ACCESSION NR: AP4037574

with magnetic properties and other questions. It is shown that the type of symmetry of the coordinate part of the wave function of the electron pair manifests itself first of all in the appearance of an "exchange" part of the matrix element, characterizing the transitions of these pairs and having different signs in the singlet and in the triplet states. The exchange parts of the matrix elements characterizing the interaction of the conduction electrons, induced by phonons, Coulomb forces, and also spin waves of a ferromagnet or an antiferromagnet, are determined. The effect of the exchange part of the interaction on the establishment of the superconducting state with singlet or triplet pairs is discussed. In addition, trial wave functions of a superconductor with triplet or triplet pairs corresponding to the Bardeen, Cooper, and Schrieffer method (Phys. Rev. v. 108, 1175, 1957) are constructed and the corresponding variational problem is solved. The manifestations which make it possible to include the triplet pairs in the Bogolyubov method (N. N. Bogolyubov, V. V. Tolmachev, D. V. Shirkov, Novy'y metod v teorii sverkhprovedi-

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ACCESSION NR: AP4037574

mosti, 1958) and in the method of two-time temperature Green's functions (D. N. Zubarev, UFN v. 71, 71, 1960), are also indicated. It is shown that the presence of the "exchange" part of the matrix element, determining the transitions of the singlet or triplet pairs, is indeed a general property of all the interactions considered above (induced by virtual photons, Coulomb forces, or virtual waves of a ferromagnet or antiferromagnet). In the vicinity of the Fermi surface the character of the interaction described by the exchange part corresponding to the triplet states experiences an abrupt transition from attraction to repulsion for the interaction induced by the phonons and conversely from repulsion to attraction for interactions induced by Coulomb forces or spin waves). The latter can explain the coexistence of superconductivity with ferromagnetism or antiferromagnetism, or else paramagnetism. Orig..art. has: 60 formulas.

ASSOCIATION: Institut fiziki metallov Akademii nauk SSSR (Institute

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ACCESSION NR: AP4037574

of Physics of Metals, Academy of Sciences SSSR); Chelyabinskiy
gosudarstvennyy pedagogicheskiy institut (Chelyabinsk State Peda-
gogical Institute)

SUBMITTED: 26Apr63

DATE ACQ: 09Jun64

ENCL: 00

SUB CODE: EM

NR REF SOV: 016

OTHER: 013

Card 4/4

VONSOVSKIY, S.V.; IZYUMOV, Yu.A.

Theory of sd -exchange interaction in transition metals.
Izv. AN SSSR. Ser. fiz. 28 no. 3:406-411 Mr '64. (MIRA 17:.)

1. Institut fiziki metallov AN SSSR.

VLASOV, K.B.; VOLKENSHTEYN, N.V.; VONSOVSKIY, S.V.; MITSEK, A.I.;
TURCHINSKAYA, M.I.

The phenomenon of unidirectional anisotropy. Izv. AN SSSR.
Ser. fiz. 28 no. 3:423-429 Mr '64. (MIRA 17:5)

1. Institut fiziki metallov AN SSSR i Ural'skiy gosudarstvennyy
universitet.

VONSOVSKIY, S.V.; SVIRSKIY, M.S.

Problem of the coexistence of ferromagnetism and superconductivity. Izv. AN SSSR. Ser. fiz. 28 no. 3:418-422 M: '64.

(MIRA 17:5)

1. Institut fiziki metallov AN SSSR i Chelyabinskiy gosudarstvennyy pedagogicheskiy institut.

VONSOVSKIY, S.V.; SVIRSKIY, M.S.

Superconductivity of an electron system with singlet or
triplet pairs. Zhur. eksp. i teor. fiz. 46 no.5:1619-1631
My '64. (MIRA 17:6)

1. Institut fiziki metallov AN SSSR i Chelyabinskiy gosudarstvennyy
pedagogicheskiy institut.

ACCESSION NR: AP4017348

S/0126/64/017/002/0168/0175

AUTHORS: Vonsovskiy, S. V.; Svirskiy, M. S.

TITLE: Effect of conduction electron exchange on ferromagnetic spin ordering in metals

SOURCE: Fizika metallov i metallovedeniye, v. 17, no. 2, 1964, 168-175

TOPIC TAGS: conduction electron exchange, electron polarization, ferromagnetic spin ordering, Hamiltonian, Fermi operator, Green's function, spin-ordered state

ABSTRACT: The effect of conduction electron exchange on electron polarization (satisfied by s-d or s-f exchanges) and on ferromagnetic spin ordering of electrons in the incomplete electronic shells of metallic atoms has been studied analytically. The Hamiltonian of the d and f electrons is written in terms of Fermi operators, and its solution is carried out by introducing the two-dimensional Green's function, limiting it to a first approximation. The energy of the system thus is represented by

$$\langle H \rangle = E_0 - I_0 - \frac{3n}{16\epsilon_0} \frac{J^2}{(1-s)} (\langle n_{s1} \rangle - \langle n_{s2} \rangle)^2 - \frac{1}{2} J n_s n_s$$

where $n_s = \sum \langle n_{s1} \rangle$, $E_0 = \frac{3}{5} n \zeta_0$, $I_0 = 4\pi e^2 \left(\frac{3n}{8\pi} \right)^{1/2}$

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ACCESSION NR: APh017348

The kinetic and transfer energy of the conduction electrons at $n_i = n_f = n/2$ and the two terms on the right hand side of the above expression account for the effect s-d or s-f of the (J) exchange. The third term shows that the spin-ordered state of interior shells appears in a more favorable energy state than in the absence of such ordering. This mechanism of indirect exchange thus appears to be $(1 - \alpha)^{-1}$ times more effective when including the conduction electron exchange term. For Gd the coefficient $(1 - \alpha)^{-1}$ yields a value of 1.75. Orig. art. has: 40 equations.

ASSOCIATION: Institut fiziki metallov AN SSSR (Institute of Physics of Metals AN SSSR); Chelyabinskii gosudarstvennyi pedinstitut (Chelyabinsk State Teachers College)

SUBMITTED: 14Sep63

DATE ACQ: 18Mar64

ENCL: 00

SUB CODE: FH

NO REF SOV: 006

OTHER: 004

Card 2/2

ACCESSION NR: A74023382

S/0048/64/028/003/0415/0422

AUTHOR: Vonsovskiy, S.V.; Svirskiy, M.S.

TITLE: On the problem of existence of ferromagnetism and superconductivity /Report, Symposium on Ferromagnetism and Ferroelectricity held in Leningrad 30 May & 5 June 1963/

SOURCE: AN SSSR. Izvestiya. Seriya fizicheskaya, v.28, no.3, 1964, 418-422

TOPIC TAGS: ferromagnetism, paramagnetism, superconductivity, electron spin, Bardeen-Cooper-Schrieffer theory, superconductivity with ferromagnetism

ABSTRACT: The problem of the existence of ferromagnetism and superconductivity is of interest in view of the fact that investigation thereof can yield information of the physical nature of ferromagnetism and superconductivity in metals and thereby serve for further elaboration of the pertinent parts of solid state theory. This problem is intimately bound in with the question of the influence exerted on interaction of conduction electrons by shift of the Fermi momentum surfaces for electrons with different spin components and by exchange of virtual spin waves. The latter factor also obtains in antiferromagnets; hence discussion of it is of added

Card ^{1/3}

ACCESSION NR: AP4023382

interest. There appears to be unanimity of opinion among investigators regarding the role played by the first factor, which was first mentioned in 1958 by the present authors (Doklady AN SSSR, 122, 204, 1958). The second factor is generally agreed to give rise to repulsion of electron pairs in the singlet state and thus hamper or inhibit superconductivity. However, other students report (A. I. Akhizyzer and I. Ya. Pomeranchuk, Zh. eksp. i teor. fiz., 36, 859, 1959 and A. I. Akhizyzer and I. A. Akhizyzer, Ibid., 43, 2208, 1962) that in the triplet state (zero projection of the pair spin) a change occurs in the sign of the matrix elements defining the electron interaction so that an additional attraction favoring establishment of superconductivity appears. Hence it was deemed desirable to consider the question of Cooper pairs in singlet and triplet states in more detail in the framework of the Bardeen-Cooper-Schrieffer-Bogolyubov theory. The question is analyzed in the present paper. Equations are written for the interaction Hamiltonian with operators to distinguish between the singlet and triplet states. Some of the results of the analysis are the following: In a nonhomogeneous ferromagnet superconductivity and ferromagnetism can exist in the case of sufficiently weak sd and sf interaction. The shift of the Fermi momentum surfaces decreases by

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ACCESSION NR: AP4023382

a significant factor as compared with the $2p$ value obtaining in the normal state. Persistence of the reduced shift permits realization of ferromagnetism due to superexchange interaction. In addition, an inequality is derived to evaluate the upper bound of the field H for which there may exist both superconductivity and paramagnetism. This inequality is a generalization of A. M. Clogston's criterion. (Phys. Rev. Letters, 8, 367, 1962). Orig. art. has: 21 formulas.

ASSOCIATION: Institut fiziki metallov Akademii nauk SSSR (Institute of the Physics of Metals, Academy of Sciences SSSR); Chelyabinskiy gosudarstvennyy pedagogicheskiy institut (Chelyabinsk State Pedagogical Institute)

SUBMITTED: 00

DATE ACQ: 10Apr64

ENCL: 00

SUB CODE: PH

NO REF SOV: 003

OTHER: 005

Card: 3/3

ACCESSION NR: AP4023381

S/0048/64/028/003/0406/0411

AUTHOR: Vonsovskiy, S.V.; Izyumov, Yu.A.

TITLE: Contribution to the theory of sd-exchange interaction in transition metals
[Report, Symposium on Ferromagnetism and Ferroelectricity held in Leningrad 30 May
to 5 June 1963]

SOURCE: AN SSSR. Izvestiya. Seriya fizicheskaya, v.28, no.3, 1964, 406-411

TOPIC TAGS: electron interaction, sd-exchange interaction, indirect exchange interaction, superexchange interaction, transition metal magnetic moment, transition metal form factor, dilute alloy ferromagnetism, rare earth helicoid structure

ABSTRACT: A unified treatment is given of the following three problems involving interaction between localized and collectivized electrons in transition metals: indirect exchange interaction via the conduction electrons; the magnetic form factor of a transition metal ion; the effective magnetic moment of a transition metal ion. The Dirac operator for the sd-exchange interaction between the conduction and the bound electrons is expressed in the second quantization representation. The indirect exchange interaction is to be obtained from this by eliminating the creation and

Card 1/3

ACCESSION NR: AP4023381

and destruction operators a_{ks}^+ and a_{ks} for the conduction electrons. This is accomplished approximately by averaging over the grand canonical ensemble. The indirect exchange interaction and the electron spin density are thus expressed in terms of the same correlator $\langle a_{ks}^+ a_{ks} \rangle$, where the brackets indicate the average over the canonical ensemble. The correlator is evaluated by the two dimensional Green's function method of N.N.Dogolyubov and S.V.Tyablikov (Dokl.AN SSSR,126,53,1959). The integro-differential equation for the two dimensional Green's function is solved by iteration, and a perturbation series is obtained for the correlator. To evaluate the indirect exchange integral, it is assumed (for lack of information to the contrary) that the sd-exchange integral is independent of the momentum transfer. The indirect exchange integral is evaluated in closed form for the case that the conduction band is either thinly or densely populated, so that the free quasiparticle approximation can be employed for electrons or holes. The indirect exchange integral in this case is long range (inverse cube) and oscillatory. Indirect exchange of this type is responsible for ferromagnetism in dilute alloys and for the formation of helicoid structure in rare earth metals. If the conduction band is roughly half filled, the character of the indirect exchange interaction is entirely different, but no general conclusions can be drawn concerning it. The electron spin density about a transi-

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Card

ACCESSION NR: AP4023381

tion metal ion, and hence the magnetic form factor and effective spin of the ion, are determined by the same correlator that determines the indirect exchange interaction. Expressions are derived for the effective form factor and spin. With the aid of these formulas, conclusions can be drawn concerning the indirect exchange interaction from measurements of the form factor or the magnetic moment of transition metal ions. Orig.art.has; 26 formulas.

ASSOCIATION: Institut fiziki metallov Akademii nauk SSSR (Institute of Physics of Metals, Academy of Sciences, SSSR)

SUBMITTED: 00

DATE ACQ: 10Apr64

ENCL: 00

SUB CODE: PH

NR REF SOV: 005

OTHER: 003

Card 3/3

VVEDENSKIY, B.A., glav. red.; VUL, B.M., glav. red.; SHTEYNMAN, R.Ya., zam. glav. red.; BALDIN, A.M., red.; VONSOVSKIY, S.V., red.; GALANIN, M.D., red.; ZERNOV, D.V., red.; ISHLINSKIY, A.Yu., red.; KAPITSA, P.L., red.; KAPTSOV, N.A., red.; KOZODAYEV, M.S., red.; LEVICH, V.G., red.; LOYTSYANSKIY, L.G., red.; LUK'YANOV, S.Yu., red.; MALYSHEV, V.I., red.; MIGULIN, V.V., red.; REBINDER, P.A., red.; SYRKIN, Ya.K., red.; TARG, S.M., red.; TYABLIKOV, S.V., red.; FEYNBERG, Ye.L., red.; KHAYKIN, S.E., red.; SHUBNIKOV, A.V., red.

[Encyclopedic physics dictionary] Fizicheskiy entsiklopedicheskiy slovar'. Moskva, Sovetskaya Entsiklopediya.
Vol.4. 1965. 592 p. (MIRA 18:1)

VONSOVSKIY, Sergey Vasil'yevich; FAYNBOYM, I.B., red.; ATROSHCHENKO,
L.Ye., tekhn. red.

[The nature of magnetism] Priroda magnetizma. Moskva, Izd-
vo "Znanie," 1964. 38 p. (Novoe v zhizni, nauke, tekhnike.
IX Seriya: Fizika, matematika, astronomiya, no.3)
(MIRA 17:3)

1. Chlen-korrespondent AN SSSR (for Vonsovskiy).

VONSOVSKIY, S.V.; IZYUMOV, Yu.A.

"Methods of Green's functions in statistical mechanics" by V.L.
Bonch-Bruевич, S.V. Tiablikov. Reviewed by S.V. Vonsovskii,
Yu.A. Iziumov. Usp. fiz. nauk 81 no.2:403-405 0 '63.

(MIRA 16:12)

VONSOVSKIY, S.V.; SVIRSKIY, M.S.

Effect of the exchange of conductivity electrons for a ferromagnetic ordering of spins in metals. Fiz. met. i metalloved. 17 no.2:168-175 F '64. (MIRA 17:2)

1. Institut fiziki metallov AN SSSR i Chelyabinskiy gosudarstvennyy pedagogicheskiy institut.

I 31538-66 EWT(m)/EWP(t)/ETI LJP(c) JD
ACC NR: AP6016035 SOURCE CODE: UR/0030/66/000/004/0077/0092

AUTHOR: Vonsovskiy, S. V. (Corresponding member AN SSSR)

ORG: none

TITLE: Physics of magnetic materials

SOURCE: AN SSSR. Vestnik, no. 4, 1966, 77-92

TOPIC TAGS: magnetic metal, magnetism, magnetization, magnetic hysteresis, magnetic domain structure, magnetic field, nuclear shell model, ferrite.

ABSTRACT: This is a popular review article dealing with the nature of magnetism and magnetic phenomena, the strengths of magnetic fields existing in nature, the production of strong magnetic fields, interactions of magnetic fields associated with particle production and annihilation, sources of atomic magnetism, magnetism and the nuclear shell model, magnetic ordering in metals and alloys, types of magnetically ordered materials, ferrites, magnetic domain structure, magnetization and hysteresis, classification of magnetic materials from the point of view of their engineering applications (soft and hard magnetics), and various applications of magnetic materials. Numerous references are made to contributions by Soviet scientists to the theory and practice of magnetism. Orig. art. has: 12 figures and 8 formulas.

SUB CODE: 20/ SUBM DATE: 00
Card 1/1 *zc*

L 07105-67 EWT(m)/EWP(t)/ETI IJP(c) JD/JG

ACC NR: AP6029097

SOURCE CODE: UR/0048/63/030/006/0906/0914

AUTHOR: Vonsovskiy, S.V.; Irkhin, Yu.P.; Svirskiy, M.S.

ORG: Institute of Metal Physics, Academy of Sciences, SSSR (Institut fiziki metallov Akademii nauk SSSR); Chelyabinsk State Pedagogic Institute (Chelyabinskiy gosudarstvennyy pedagogicheskiy institut)

TITLE: Exchange interactions in rare earth metals²¹ and alloys (Report, All-Union Conference on the Physics of Ferro- and Antiferromagnetism held 2-7 July 1965 in Sverdlovsk)

SOURCE: AN SSSR. Izvestiya. Seriya fizicheskaya, v. 30, no.6, 1966, 906-914

TOPIC TAGS: rare earth metal, electron interaction, exchange interaction, magnetic property, superconductivity, phase transition, mathematic physics

ABSTRACT: The authors employ the formalism of second quantization to discuss the exchange interaction between conduction electrons and the electrons in the f shells of the ions of a rare earth metal lattice, and the exchange interaction between the f electrons to which it gives rise. Additional terms to the s-f exchange Hamiltonian of S.N.Liu (Phys. Rev., 121, 451, (1961)) are obtained, which contain operators that change the total angular momentum J of the f-shell electrons by one unit, and the effects of the new terms on magnetic ordering, superconductivity, and phase transitions are discussed. The $J_n \cdot J_m$ terms in the f-f exchange Hamiltonian obtained in the second order

Card 1/2

L 07105-87

ACC NR: AP6029097

of perturbation theory are independent of energy, the s-f exchange associated with change of J, therefore, cannot lead to long range magnetic order. The new terms in the s-f exchange Hamiltonian lead to interactions between singlet and triplet pairs of conduction electrons. The interaction between singlet pairs is repulsive and results in a reduction of the transition temperature to the superconducting state. The reduction of the transition temperature of La by admixtures of Eu is quantitatively (within 20%) accounted for. The addition of other rare earth metals than Eu, for which $J \neq 0$, only slightly affects the transition temperature. The effect of Eu on the $\gamma - \alpha$ phase transition temperature in Ce is also accounted for. A second, more general, exchange Hamiltonian is expressed with the aid of second quantization operators for groups of electrons in a form involving coefficients that can be evaluated in any particular case by use of the appropriate fractional parentage and 6j coefficients. With the aid of this Hamiltonian one can treat anisotropic effects that arise through participation of the orbital angular momentum of the conduction electron, rather than its spin, in the exchange process. Orig. art. has: 27 formulas.

SUB CODE: 20

SUBM DATE: 00

ORIG. REF: 007

OTH REF: 015

Card

2/2

Vonstăntinescu, C.

CONVINCITIVE ✓
Journal (in caps); Given Name

Country: Rumania

Academic Degrees: Veterinarian ✓

Affiliation: Central Station of Artificial Inoculations (Statiunea
Centrala de Inoculatii Artificiale).

Course: Bucharest, Probleme Zootehnice si Veterinare, No 7, Jul 61,
pp 24-27.

Topic: "Observations on the Efficacy of Conadotropic Serum in
Combating Infecundity in Cows."

Co-authors:

✓ KIRALIESCU, C., Dr., Ministry of Agriculture (Ministerul
Agriculturii).

✓ DE SINC, M., Veterinarian, "Pasteur" Institute of Serums and
Vaccines (Institutul de Seruri si Vaccinuri "Pasteur").

✓ VONSTANTINESCU, C., Veterinarian, "Pasteur" Institute of Serums
and Vaccines.

VONSUATSKIY, A.T.

VONSYATSKIY, A.T., inzh.; ROYZMAN, I.B., inzh.; KUZNETSOV, S.M., inzh.

Transportation and assemblage of 34.2m reinforced concrete span
members. Transp.stroi. 11 no.3:21-22 Mr '61. (MIRA 14:3)
(Bridge construction)

BERLIN, A.A.; VONSYATSKIY, V.A.; LYUBCHENKO, L.S.

Electron paramagnetic resonance spectra (EPR) of some polynuclear aromatic hydrocarbons. Izv. AN SSSR Ser. khim. no.7:1184-1188
Jl '64. (MIRA 17:8)

1. Institut khimicheskoy fiziki AN SSSR.

VONSYATSKIY, V.A.; KALYAYEV, G.I.; BERLIN, A.A.

Kinetics of interaction between polyphenylene and 1,1-diphenyl-2-picrylhydrazyl. Izv.AN SSSR.Ser.khim. no.2:304-309 F '64.
(MIRA 17:3)

1. Institut khimicheskoy fiziki AN SSSR.

ACCESSION NR: AP4013331

S/0020/64/154/003/0627/0630

AUTHORS: Berlin. A.A.; Vonsyatskiy, V.A.

TITLE: Induced reactivity of several compounds with conjugated systems on reacting with 1,1-diphenyl-2-picrylhydrazyl

SOURCE: AN SSSR. Doklady*, v. 154, no. 3, 1964, 627-630

TOPIC TAGS: conjugated polymer, paramagnetic polymer, induced reactivity, hydrogen transfer, pi complex, polymer chemistry, polyphenylene, electron paramagnetic resonance, paramagnetic activation, 1,1-diphenyl-2-picrylhydrazyl, paramagnetic induction of reactivity

ABSTRACT: The reaction of 1,1-diphenyl-2-picrylhydrazyl (DFPH) with solutions of paramagnetic polymers containing conjugated bond systems (polyphenylene (PF), polyazophenylene, polymethylpyridylacetylene, polyphenylacetylene, and heat-treated anthracene) and with anthracene monomer, was studied spectrophotometrically and by the EPR. DFPH is not destroyed in solution with anthracene, which is

Card 1/3

ACCESSION NR: AP4013331

not paramagnetic, but is destroyed on addition of PF; its destruction increases with temperature and is dependent on the presence of oxygen. The destruction is associated with the transfer of H from the conjugated system (not from the solvent) to form 1,1-diphenyl-2-picrylhydrazine, but not a DPFH-PF compound. The following reaction mechanism proposed: DPFH dissolves to form solvated complexes, which on addition of PF form a DPFH(PF)solvent pi-complex. Paramagnetic centers of the PF activate the S-T transition of the diamagnetic PF macromolecule, making possible the transfer of the H to the acceptor DPFH. The active PF radical thus formed breaks off an H (or other atom, e.g. halogen) from the solvent molecule in the complex, and the remaining solvent radical reacts with a second molecule of DPFH (or recombines). This mechanism explains the relatively low effective activation energy, the acceleration of the reaction with increasing conjugated bond polymer concentration, and the presence of two low molecular end products. This induction of reactivity by paramagnetic centers of polymers with conjugated bond systems opens the road to new methods in organic and polymer chemis-

Card 2/3

ACCESSION NR: AP4013331

try. "...ebullioscopic measurements were carried out with V.V. Tartarintsev." Orig. art. has: 4 figures and 4 equations.

ASSOCIATION: Institut khimicheskoy fiziki, Akademii nauk SSSR
(Institute of Chemical Physics, Academy of Sciences SSSR)

SUBMITTED: 07Aug63

DATE ACQ: 26Feb64

ENCL: 00

SUB CODE: CH

NO REF SOV: 008

OTHER: 003

Card 3/3

SLONIM, I.Ya.; URMAN, Ya.G.; VONSYATSKIY, V.A.; LIUGON'KIY, B.I.;
BERLIN, A.A.

Nuclear magnetic resonance in polymers with a system of
conjugate bonds. Dokl. AN SSSR 154 no.4:914-917 F '64.

(MIRA 17:3)

1. Institut khimicheskoy fiziki AN SSSR i Nauchno-issledo-
vatel'skiy institut plasticheskikh mass. Predstavleno akademi-
kom V.I. Kondrat'yevym.

VONSYATSKIY, V.A.; ASEYEV, Yu.G.; KASATOCHKIN, V.I.; BERLIN, A.A.

Spectral study of polyphenylene and its block copolymers with
p-diethynylbenzene. Izv. AN SSSR. Ser.khim. no.9:1654-1658
S '63. (MIRA 16:9)

1. Institut khimicheskoy fiziki AN SSSR i Institut goryuchikh
iskopayemykh.

(Phenylene group) (Benzene) (Spectrum analysis)

BERLIN, A.A.; VONSYATSKIY, V.A.; LYUBCHENKO, L.S.

Effect of local activation. Izv.AN SSSR.Otd.khim.nauk no.7:1312
Jl '62. (MIRA 15:7)

1. Institut khimicheskoy fiziki AN SSSR.
(Paramagnetic resonance and relaxation) (Macromolecular compounds)

BERLIN, A.A.; VONSYATSKIY, V.A.

Induced reactivity of compounds with conjugate double bonds.
Izv.AN SSSR.Otd.khim.nauk no.7:1312-1313 JI '62. (MIRA 15:7)

1. Institut khimicheskoy fiziki AN SSSR.
(Polymers--Spectra) (Conjugation (Chemistry))

BERLIN, A.A.; VONSYATSKIY, V.A.

Induced reactivity of certain compounds having a conjugate system
when interacting with 1,1-diphenyl-2-picrylhydrazyl. Dokl. AN
SSSR 154 no. 3:627-630 Ja '64. (MIRA 17:5)

1. Institut khimicheskoy fiziki AN SSSR. Predstavleno akademikom
N.N.Semenovym.

SIVERGIN, Yu., nauchnyy sotrudnik; VONSYATSKIY, V., nauchnyy sotrudnik

Simultaneous creation of the material and part. Izobr. 1
rats. no.12:4 '63. (MIRA 17:2)

1. Institut khimicheskoy fiziki AN SSSR.

ZAIRINA, R.G. (Kiyev, ul. Saksaganskogo, d. 83, kv. 1); VONSYATSKIY, V.A. (Kiyev, ul. Chudnovskogo, d. 19, kv. 12)

Distribution of ethylene-substituted phosphoramines in certain tissues and organs of animals. Vop. onk. 4 no.5:557-561 '58. (MIRA 12:1)

1. Iz ukrainskogo nauchno-issledovatel'skogo sanitarno-khimicheskogo instituta (dir. - dots. N.I. Iuganskiy).

(CYTOTOXIC DRUGS, metabolism

bis(1-aziridinyl)-phenylamine phosphine oxide, distribution in various organs in animals (Rus))

USSR / Forestry. Forest Crops

K-4

Abs Jour: Ref Zhur-Biol., No 13, 1958, 58410

Author : Vopkhvadze, V. M.

Inst : Forest Institute, AS GruzSSR

Title : The peculiarities of the Growth and Development
of Forest Cultivation in the Vicinity of Tbilisi
with Respect to Soil Conditions and Methods of
Improvement

Orig Pub: Tr. in-ta lesa, AN GruzSSR, 1957, 7, 115-135

Abstract: The slow growth of forest cultivation in the vicinity of Tbilisi is noted. This area has been cultivated for 60 years. The principal reasons causing the slow progress of planting are described, and the influence of different kinds of soil cul-

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USSR / Forestry. Forest Crops

K-4

Abs Jour: Ref Zhur-Biol., No 13, 1958, 58410

tivation on crops is examined in detail. Agrotechnical advice is given. Advice on the selection of species and their disposition, depending on ecological and forestgrowth conditions of the territories to be afforested, are given. The altitude is also to be taken into consideration.

Card 2/2

-16

KORNEYEV, K.A.; VONSYATSKIY, V.A.

Synthesis of H -phenyl- H^1, H^1, H^2, H^2 -diethylentrisazide phosphoric
acid labelled by P^{32} . Ukr. khim. zhur. 24 no. 2:226-227 '58.
(MIRA 11:6)

1. Ukrainskiy nauchno-issledovatel'skiy sanitarno-khimicheskiy
institut.

(Phosphorus--Isotopes)
(Phosphoramide)

BERLIN, A.A.; VONSYATSKIY, V.A.; LIOGON'KIY, B.I.

Quasiradical block polymerization. Dokl. AN SSSR. 144, no.6:1316-1319 Jo '62. (MIRA 15:6)

1. Institut khimicheskoy fiziki Akademii nauk SSSR. Predstavleno akad. V.N.Kondrat'yevym.
(Polymerization)

VON TELEGD, Karoly Roth,

"A kinc stari asvanyolaj es foldgazkutatas es termeles 1935-tol, a mai allapot es a jovo kilatasok," Magyar Banyaszati es Kohaszati Lapok, LXXII, No. 9 (1939), 189-200.

So: Nat. Committee for a Free Europe. Mid-European Studies Center.
The Hungarian Oil Industry, New York, 1954, Unclassified.

VON TILLY, Karoly Roth

Magyarorszag Szocializmus (Budapest: Szocializmus, 1929)

RC: Nat. Committee For a Free Europe. Mid-European Studies Center. The Hungarian
Oil Industry, New York, 1954, Unclassified

BC

determination the unsaturation and lime requirement of soils. I. vol Celky and I von Tobek (Proc 2nd. internat. og. Soil Sci., 1932, 4, 175-180). Variations in the technique adapted in determining the hydrolytic acidity of solids by treatment with $\text{Ca}(\text{H}_2\text{O})_2$ lead to marked differences in the vials obtained which are not comparable in soils of different type. Soils are classified as unconditionally CaO deficient and conditionally CaO deficient and characteristic limiting vials. of ph and hydrolytic acidity (Kappen) associated with the classification are recorded for various solid types.

AGM-554 METALLURGICAL LITERATURE CLASSIFICATION

FROM SYNERGY

IN REPLY TO

RELATIONS

ROOM NUMBER

RECEIVED AND DATE

VONTOR, A.

"Inclined shaft skips in coal mines."

Uhli, Praha, Vol 4, No 1, Jan. 1954, p. 19

SO: Eastern European Accessions List, Vol 3, No 10, Oct 1954, Lib. of Congress

BC

Classification of wine. L. von VARGY, (Hungary), 1932, S. 288-308. Chem. Abstr., 1932, B, 8316).—An electrolyte-sensitive compound of gelatin and tannin, not good. In presence of protective colloids (pectin), is probably formed. If much gelatin is present the protective action is excessive and separation commences. In presence of low amount gelatin the excess acts as a protective colloid. In presence of protective colloids emuls. dissolved with a little KHCO_3 or citric acid, gave good results. A. A. E.

B-3-3

BC

Class. E. von Kuvshinov. Anal. to E. von Kuvshinov
(U.S.P. 1,842,772, 1931; Anal. 23.10.33. Hung.
25.10.33). A. white from coal and having the
appearance of porcelain to white from dolomite and
quartz sand. An. composition being MgO 4-21, CaO
13-32, and SiO₂ 60-70% F. Y.

B-1-4

CLASSIFICATION										PROCESS AND PROPERTIES INDEX										SUBS AND SYN INDEX									
BC																				A 3									
<p>Micro-acetyl determination. Titration of weak bases. E. FOR VITTS (<i>Mikrochim. Acta</i>, 1937, 4, 236-237).—A simplified form of apparatus is described. Phosphotungstic acid is used in place of p-C₆H₄-SO₃H as a hydrolysing agent, and dioxan as a solvent for Ac compounds of low solubility. The titration of weak acids by weak bases is discussed, and NH₄(CH₃)₂OH is recommended for the titration of AcOH and other weak acids. The method gives satisfactory results with 0.7 mg. of phenastin or 0.4 mg. of cellobiose acetoacetate. The possibility of a new acidimetric method for the determination of fructose is pointed out.</p> <p style="text-align: right;">L. S. T.</p>																													
ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION																													
MATERIALS INDEX										PROCESSING INDEX										PROPERTY INDEX									
ALUMINUM										COPPER										IRON									
STEEL										TUNGSTEN										ZINC									
BRASS										NICKEL										SILVER									
GOLD										PLATINUM										OTHER									

13C

PROCEDURES AND PROPERTIES INDEX

a-1

Laboratory aids for analytical work. F. von
 Vitorra (Mikrochem. Acta, 1937, 2, 200-213).—A
 constant-level device, a wash-bottle which limits the
 amount of liquid delivered, a soda-lime tube, and a
 Jena glass indicator bottle which minimizes indicator
 changes due to alkali content of the glass and the
 action of light, are described and illustrated.

C. R. H.

ASB-SLA DETAILING LITERATURE CLASSIFICATION

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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[illegible]

BCS

641. Water absorption of melting oxides.—H. VON WARTENBERG (Z. Elektrochem., 55, 445, 1951). It can be shown that some hydroxides, e.g., those of Be and Al, are stable above 2,000° C. when dissolved in their molten oxide and, in small quantities, even when in the gaseous state. In view of the ignitions of ppd. hydrides in analytical chemistry, this is of interest. It was observed that rods of Al_2O_3 a few mm. thick gave clear melting beads in the oxyhydrogen flame, whereas when melted down rapidly they gave beads which swelled during cooling or spurted. The same result was observed with BeO and La_2O_3 . Apparently the fusion gave off a gas which escaped during freezing. This gas could only be H_2O . The same was observed during melting in a ZrO_2 tube (heated from outside) when vapour was introduced. The process is explained thus: H_2O absorbed during melting has no place in the crystal lattice and escapes during freezing. This water absorbed by the fusion cannot be water of hydration; it is assumed that there exists a cpd. which withstands 2,000° C.

VONWILLER, F.

"Microscopical examination of the living nervous system." (p. 310) by Vonwiller, F.

SO: Advanced in Contemporary Biology (Uspekhi Sovremennoi Biologii) Vol. VI, No. 2 1937

VONWILLER, P.

"The Electron Microscope" (p. 535) by Vonwiller, P.

SO: Advances in Modern Biology, (Uspekhi Sovremennoi Biologii), Vol. X, No. 3, 1939

VONWILLER, P.

"Fourth International Congress of Experimental cytology." (p. 362) by Vonwiller, P.

SO: Advanced in Contemporary Biology (Uspekhi Sovremennoi Biologie) Vol. VI, No. 2 1937

107 AND 108 CROSS

106 AND 109 CROSS

PROCESSING AND PROPERTIES INDEX

BC

A-4

Flower colour pattern of the garden Petunia.
I. Brösman and H. von Wettach (Planta, 1937, 27,
1-29). In the white form of garden petunia petals
the presence of the anthocyanin pigment was un-
detectable. The colour of petals is directly deter-
mined by the leaf stage and total water stress by light
effects on chlorophyll. However, the probable presence
of the pigment, is first apparent in petals when these
are 4-5 mm. long. The flavanol content increases
with advancing development and anthocyanin forma-
tion begins in petals 20-30 mm. long. A. G. P.

COMMON VALUE IS MORE

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ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION

CLASSIFICATION

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BC

Volumetric determination of sulphate with sodium rhodizonate. L. von ZOMBOY (Magyar chem. Föl., 1936, 41, 180-182; Chem. Abstr., 1936, 1, 3369).—The applicability of the method is confirmed, J. R. A.

a-1

ASB-36A METALLURGICAL LITERATURE CLASSIFICATION

AP7001464 (N)

SOURCE CODE: HU/0038/66/003/011/0342/0344

AUTHOR: Voo, Endre (Graduate chemical engineer)

ORG: Industrial Research Institute for Synthetic Materials, Budapest (Muanyagi-pari Kutato Intezet)

TITLE: Industrial application of unsaturated polyester resins Preparation of master molds

SOURCE: Muanyag es gumi, v. 3, no. 11, 1966, 342-344

TOPIC TAGS: unsaturated polyester resin, shipbuilding engineering, shipbuilding

ABSTRACT: The use of unsaturated polyester resin to make master molds, described and demonstrated by an example, was developed in cooperation with the Gheorghiu Dej Shipyard (now the Hungarian Ship and Crane Works, Angyalfold). The technical and economic advantages and drawbacks of this process are presented by calculations. It was found that the making of even complex and bulky molds from resins was economical and that their characteristics were preferable to those of conventional molds. Orig. art. has: 5 figures. [Based on author's abstract]

[KS]

SUB CODE: 11, 13/SUBM DATE: none/ORIG REF: 002/
Card 1/1

Fuel Abstracts

3650. NEW P.N.E.M. POWER STATION ON RIVER AMER. Voogt, J.G. de
(Electrotechniek, 3 and 17 July 1952, vol. 30, 241-245, 263-267).
Constructed with assistance from Marshall Aid the Amer power station
has four 110/130 tons/h, 510°C, 98, atms. pulverized fuel-fired boilers
supplied by International Combustion Engineering and Superheater Co
of New York which feed two 50/56 MW Brown Boveri units and a 7.2-9.0
MW house generator on steel foundations. The coal park is supplied by
an overground system but feeds the boiler house by an underground system.
The opening ceremon. is described and relevant speeches made are reported.
B.B.A.

B-C

B-I-7

Agging of electrical insulating materials. I.
GOLDMAN and R. YOUNG (Tech. Physics USSR, 1934,
1, 62-64). Breakdown of paper, varnished cloth,
and cellulose acetate is due to the action of O₂ and N
oxides formed by discharge faults, and is minimized by
avoiding air gaps. D. R. D.

650-51A - METALLURGICAL LITERATURE CLASSIFICATION

FROM SOURCE

DISPOSITION

REMARKS

*In the library of the
of the Ministry of
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1. On the Heat-Transfer Coefficient (Tem-
perature Coefficient and Composition of
Ceramic Oxides).—B. Vol. 8, No. 1.
Zhurnal. (Journ. of Phys. [of USSR]), No.
6, Vol. 8, 1944, p. 384; in English, sum-
mary only, in full in Nos. 1-4, Bull. de
l'Acad. Sci. de l'URSS, Serie Physique,
1944.

W.E.

summary of Materials

1/61. CERAMIC HIGH QUALITY CONDENSERS [Temperature Coefficient and Composition of Ceramic Dielectrics].—H. Veng, & J. Skanavi. (*Journ. of Phys. [of USSR]*, No. 6, Vol. 8, 1944, p. 384; in English, summary only; in full in Nos. 1-4. *Bull. de l'Ac. des Sci. de l'URSS, Série Physique*, 1944.)

1945

PRELIMINARY AND PROVISIONAL

5 Aging of electrical insulating materials. I. Goldman
and H. Vred. *Tech. Physics U. S. R. 1*, 42 56(1934).
Breakdown of paper, varnished cloth and cellulose acetate
is due to the action of O_2 and N oxides formed by discharge
in air, and is minimized by avoiding air gaps. D. C. A.

ASME-SLA METALLURGICAL LITERATURE CLASSIFICATION

LEPAJõe, Jaan; WOOL, K., red.

[Drying, cleaning, and storage of grain] Teravilja
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Riiklik Kirjastus, 1963. 97 p. [In Estonian]
(MIRA 17:10)

SEPP, Jaan; VOOL, K., red.

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[Correspondence between wages and the efficiency of labor
in the agriculture of the Estonian S.S.R.] Töötasu vastavu-
sest tööviljakusele Eesti NSV põllumajanduses. Tallinn,
Eesti Riiklik Kirjastus, 1963. 100 p. [In Estonian]
(MIRA 17:6)

VIPPER, Heinrich; VOOL, K., red.; EINBERG, K., tekhn. red.

[Annual lupines] Üheaastased lupiinid. Tallinn, Eesti
Riiklik Kirjastus, 1962. 188 p. (MIRA 16:12)
(Lupines)

TEITEL'BAUM, Viktor; VOOL, K., red.; PEDARI, J., tekhn. red.

[Problems in the development of vegetable growing in the
Estonian S.S.R.] Koogiviljakasvatuse arendamise küsimusi
Eesti NSV-s. Tallinn, Eesti Riiklik Kirjastus, 1961. 32 p.
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(Estonia--Vegetable gardening)

LEETOJA, Rihard; VOOL, K., red.; LUMET, E., tekhn. red.

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(Estonia--Vegetable gardening)
(Greenhouse management)

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